
Impact of Project InSPIRE on Creative Thinking Among Rural Children in Malaysia

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Kajian ini meninjau kesan Projek InSPIRE dalam perihal pemikiran kreatif di kalangan murid-murid di luar bandar. Dalam kajian ini pemikiran kreatif murid-murid di sekolah Projek InSPIRE telah dibandingkan dengan pemikiran kreatif murid-murid di sekolah biasa menerusi dua ujian kreatif (ujian kegunaan tin kosong dan ujian bulatan). Kajian ini menunjukkan murid-murid Projek InSPIRE adalah lebih kreatif dalam tugas berbahasa (verbal), tetapi tidak ada perbezaan di antara kedua-dua kalangan murid dalam merajah (figural). Keputusan ini mencadangkan bahawa strategi-strategi pengajaran-pembelajaran yang diamalkan dalam projek InSPIRE boleh mengembangkan pemikiran kreatif berbahasa.

Introduction

Investigations of creative thinking received its major thrust from Guilford's work (1967) which emphasized on the process-centred approach to creativity, in contrast to the earlier personality-centred approach where specific creative individuals were subjected to intensive psychological assessment to uncover the possible motivational and cognitive bases of creative personality. In the process-centred approach the main concern has been the kind of thinking process essential to creative productivity.

Wallach (1970) believes that the 'productive' or 'creative' person is one who is committed to scan his cognitive field and retrieve remote, though appropriate information, for use in new contexts. Basically in the process approach creativity is measured in terms of three different criteria, viz. fluency and flexibility in generating ideas and originality of the ideas generated. Guilford (1967), Torrance (1968) and others have devised open-ended divergent thinking tests for this purpose.

In the context of the development of curricular and teaching strategies, the process-centred approach to creativity has received a lot of interest. One of the major aims of any new curricula is to promote creative thinking among the learners. Towards this objective, the designs of curricular and teaching strategies have been adapted to enable the children to generate their own ideas and work on them. In the traditional curricular and teaching approaches, the stress was on very specific cognitive achievements in children and generally achievement tests were used to evaluate the success of the curricula. This mode of teaching and evaluation have discouraged children from wanting to express their views and being creative. In fact, Torrance (1965) feels that stifling creative thinking and behaviour cut at the very roots of satisfaction in learning itself.

Emphasis on creative learning on the other hand has been shown to improve not only social maturity and self confidence (Maw & Maw, 1965) but also achievement (Getzels & Jackson, 1962; Feldhusen, Denny and Condon, 1965; Bentley, 1966). Therefore, it appears if curriculum design and teaching approaches were to stress and provide creative thinking and learning environment, not only achievement that might be improved but also the children might become more adaptable and confident to tackle the problems confronting them.

The Universiti Sains Malaysia's Project InSPIRE was set up to design new teaching-learning strategies that could contribute to increasing the efficiency of the teaching-learning processes in the rural elementary schools in Malaysia. One of the stated major objectives of the project was to design an instructional-cum-management system which could help to "develop to the maximum the cognitive potential of each child specially to facilitate the development of the capacity for both creative as well as objective and systematic thinking" (Project InSPIRE 1980, pp. 9).

In most curricula, classroom conditions for creative thinking are stated in global terms. More exact approaches need to be designed if creative teaching and learning is to move beyond the almost intuitive level it is in now. Penick (1976) studied the effect of two different teacher behaviour strategies on creative growth among fifth-grade science pupils. The result of this study shows that a non-directive, student structured science class can enhance the development of figural creativity. This study indicates that appropriate teaching strategies and learning environment can facilitate the creative potential of children. With this in mind Project InSPIRE has designed curricular material and instructional strategies through which it hopes to encourage creative learning environment in the selected rural school. Special instructional strategies recommended by the project are:

a) Teacher-Mediated Instruction (TMI)

In this mode of instruction the teacher teaches the whole class with the active involvement of the children in the learning process. The children are active in the sense that they are continuously encourage to process whatever information that reaches their senses. Some of the techniques generally employed by the teacher in order to facilitate processing of information are: cueing, recall, prompting a reply, suggesting and hinting to facilitate divergent thinking, questioning in order to channel cognitive processes, encouraging verbalisation of concepts learned. Besides these, the children are also involved in small group activities and simulation activities. The instructional materials to be used by the teacher are programmed, that is, the teachers are provided with lesson guides which give step-by-step instruction of how each lesson is to be conducted with maximum involvement of pupils.

b) Pupil-Mediated Instruction (PMI)

The peer-mediated instruction as conceived by Project InSPIRE is a system to structure a situation in which learners interact in a specified manner dyadically so that effective learning takes place. It is essentially a structuring of the roles 'tutor-tutee' in which a pair of students are expected to enter. During such an instructional situation, the pupils spend almost all of their time working in pairs taking turns to become 'tutor' and 'tutee'. In this approach the pupils exercise full responsibility for their own instructional progress.

c) Module-Mediated Instruction (MMI)

This consists of specially designed modules for individualizing instruction. The features that are being particularly emphasized in Project InSPIRE are:

- i) the objectives and content of a module are communicated to the learner by means of an advance organiser in the first component of the module; and
- ii) through such devices as paradoxes, cognitive surprises, humour, etc., the interest of the child is sustained and the depth of the processing of information is optimized. In standard 1, the Teacher-Mediated Instruction (TMI) was used exclusively as the main mode of instruction because at this stage the pupils did not have the required language ability to be involved in the pupil-mediated

instruction and the media-mediated instruction. In standard 2 and standard 3 the PMI and MMI were gradually introduced (see figure 1. below).

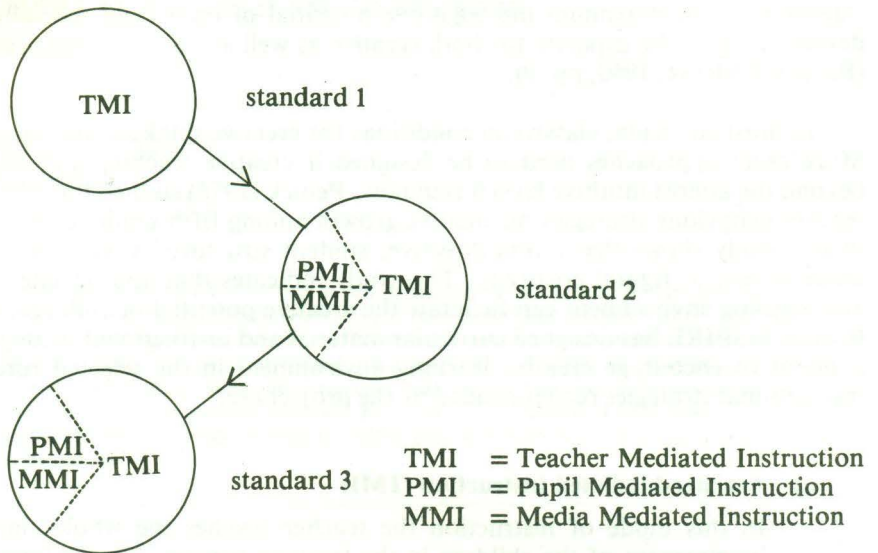


FIGURE 1: Proportion of time used with the three modes of Instruction.

Research Problem

Generally, in evaluation studies achievement tests have been used to determine how far the specific cognitive achievements which the curriculum developers desired have been achieved, and more often than not the process objectives and affective objectives are not evaluated. The present study was initiated to investigate the extent to which the modes of instructions employed in the Project InSPIRE schools have promoted creative thinking traits among the project school children.

Methodology

Sample

The sample for this study consisted of 509 pupils from Project InSPIRE schools and 584 from non-project schools. At the time of this study the Project pupils were in Standard 4 after having followed the Project InSPIRE programme for three years. The non-project pupils selected were from schools in the rural areas of North-West Malaysia which were used as control schools in other Project InSPIRE research studies. These schools were of equal standard to the project schools in terms of the school achievement in the standard 5 assessment examination.

Instrument

Two tests from the battery of Torrance Tests of Creative Thinking were selected for use in this study, namely the Unusual Uses of Tin-Can Test and the Circles Test. The Unusual Uses of Tin-Can Test required verbal responses from the pupils while the Circle Test required figural response from the pupils. The instructions for the two tests were translated to the National Language (Bahasa Malaysia.) The clarity and suitability of the language used were judged to be appropriate by the language officers of the Project InSPIRE team.

a) Unusual Uses of Tin Can Test

In this test the subject was encouraged to generate as many interesting and unusual uses to which tin cans could be put to. The one to one procedure was adopted in administering the Unusual Uses of Tin Can Test as recommended by Torrance (1968) for younger children. For this purpose six research assistants were thoroughly briefed on the administration procedure to minimize variations. The research assistants carried out the test as described here.

The research assistant sought to make the subject feel at ease while he ascertained, and recorded the essential identifying information, such as pupil's name, class and age. Then, he showed the subject a picture showing empty tin cans. The subject was *then encouraged to state as many different uses as he could to which the tin cans can be put to*. As the subject stated the uses, the research assistant wrote them down on a prescribed form. There was no time limit set but most subjects took less than 5 minutes for this exercise. No examples were given to assist the subject.

b) Circle Test

In this test the subject was required to make as many different drawings of items as possible based on 1 inch circles. The test was group-administered. The research assistant distributed the test booklets to the class. He then read the test instruction with the class and gave further clarification if an when necessary. The research assistant gave an example to illustrate what was required of the subjects.

Scoring Procedure

An individual's flency score in each of the test is the total number of different responses generated. In general, the alternative responses are not evaluated for quality but fantastic or impossible uses beyond all possible reality are not counted.

Flexibility Score

The individual's flexibility score in each of the task is the number of different classes of uses or category of uses suggested. Torrance has suggested 40 categories of uses for the Tin Can and 60 categories of items for the Circles Test. These categories were used with slight modification in the case of the Circles Test. Two categories suggested by Torrance namely Blemishes, Smears, Spots, etc., and Blots which did not get any mention among the Malaysia rural sample were replaced by two new categories; animal home and swing items. Drawings depicting animal home such as cobweb, beehive, birds' nest and sewing items such as button, press button, reel of thread were common among the pictures drawn by the rural Malaysian children. These items do not seem to fit naturally into any of the other categories suggested by Torrance.

Originality Score

The individual's originality score in each of the test was computed by adding weights to responses as suggested in the Scoring Guide of Torrance Tests of Creative thinking. But the originality weight scale provided by Torrance was found to be unsuitable for the Malaysian rural sample. The difference in the natural and cultural environment of the Malaysian children has brought about responses which are unique to the region. For example, in the Circles Tests, the fruits and the animals drawn are specific to the Asian region and some of the toys suggested for construction from the Tin Cans are unique to Asian rural children. As such, Torrance originality weight scale which was based on the statistical infrequency and/or

obviousness of the response is not suitable for use with Malaysian sample. Following the principle employed by Torrance, the statistical infrequency and/or obviousness of the responses, a new originality weight scale was formulated based on the responses of 1093 subjects who took part in the present study. In general, responses mentioned by more than 5% of the sample were assigned a weight of 0; responses mentioned by 1 to 5% of the sample were assigned a value of 1 and responses mentioned by less than 1% of the sample were given a value of 2. But some very obvious responses though infrequently mentioned were not assigned any value.

Statistical Procedures

The Statistical Package for Social Sciences (SPSS) was used in the analysis of the results of this study. For the purpose of comparing the levels of creative thinking between Project InSPIRE and Non-Project InSPIRE children, the t-test analyses were carried out. The comparison was made with respect to the mean scores of the sub-groups on the three dimensions for the verbal and the figural test and on the composite score for the verbal task and for the figure task. All tests of significance are two-tailed at the 0.05 level of probability.

Results and Discussions

Verbal Creative Thinking Among Project InSPIRE and Non-Project InSPIRE Children

A comparison of the levels of verbal creative thinking among Project InSPIRE and Non-Project InSPIRE children was carried out using the t-test analysis.

Table 1.1 presents the mean scores and standard deviations achieved by the Project InSPIRE children and Non-Project InSPIRE children on the Unusual Uses of Tin Can Test with the results of the t-test analyses.

TABLE 1.1: Mean Scores, Standard Deviations and T-test Analyses (use of Tin Can)

Variable	Sub-groups	Mean (Std. Deb.)	T-value	Significant Level
Fluency	Project (N = 509)	6.29 (4.20)	4.52	0.001
	Non-Project (N = 584)	5.18 (3.97)		
Flexibility	Project (N = 509)	3.70 (3.36)	2.48	0.01
	Non-Project (N = 584)	3.36 (2.30)		
Originality	Project (N = 509)	1.70 (2.05)	1.35	N.S.
	Non-Project (N = 584)	1.50 (2.74)		

The mean scores of the children in the Project schools are higher than the mean scores of children in the Non-Project schools in all the three dimensions of creative thinking. The differences in the means for both the fluency and flexibility dimension of creative thinking are significant at the 0.001 and 0.01 level respectively.

However, the difference in the mean scores on the originality scale does not reach statistical significance. These results seem to indicate that the teaching-learning strategies and the learning environment in the Project schools help to enhance to some extent verbal **fluency and flexibility in thinking among rural children in Malaysia.**

Table 1.2 presents the means scores and standard deviations achieved by the children in Project schools and by children in the Non-Project schools on the Circles Test with the results of the t-test analyses.

TABLE 1.2: Mean Scores, Standard Deviations and T-test Analyses (Circles Test)

Variable	Sub-groups	Mean (Std. Dev.)	T-value	Significant Level
Fluency	Project (N = 509)	11.14 (5.84)	0.42	N.S.
	Non-Project (N = 584)	10.97 (6.80)		
Flexibility	Project (N = 509)	7.14 (3.29)	1.29	N.S.
	Non-Project (N = 584)	6.85 (3.90)		
Originality	Project (N = 509)	3.60 (4.25)	0.27	N.S.
	Non-Project (N = 584)	3.52 (4.44)		

In general there is very little difference between the mean scores of the children in the Project schools and Non-Project schools.

This result suggests that the teaching-learning strategies engaged in the Project schools have little influence on creative thinking with respect to figural fluency, flexibility and originality. This may be explained by the fact that the teaching-learning strategies and the learning environment generated in the Project schools are much directed towards verbal fluency. In the teacher mediated instruction the teacher encourages verbalisation of concepts learned, prompts a reply from pupils, suggests and hints to facilitate divergent thinking.

In the pupil mediated instruction verbal interaction is encouraged between pupils. While in the module mediated instruction the pupils interact with the modules and verbalise the response. Such a learning environment seem to have developed verbal fluency and flexibility in thinking more than figural fluency.

Conclusion

The main purpose of the present study was to investigate the extent to which the instructional modes used by the Project InSPIRE schools have promoted creative thinking traits among the children in Project InSPIRE schools compared to the children in Non-Project schools.

The results show that Project schools children did better than Non-Project schools children in the verbal creative task but there was no difference in the figural task. Examination of teaching-learning strategies employed by the Project schools reveal that a great emphasis was given to verbal fluency and flexibility in thinking. Hence, the difference in performance of the children in Project InSPIRE schools and children in Non-Project schools in the verbal creative task may be attributed to the instruction system used in the Project schools.

The finding in this study suggests that the teaching-learning strategies like those used in the Project InSPIRE experiment,

- where teachers suggest and hint to facilitate divergent thinking;
- where children are encouraged to verbalise concepts learned;
- where children interact with each other during the learning process;

can help to enhance to some extent verbal fluency, flexibility and originality in thinking which are considered dimensions of creative thinking. Hence, in curriculum renewal projects efforts should be directed to select and practice appropriate teaching-learning strategies to enhance the development of creative thinking among our school children.

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